

Welber Named President

Irwin Welber will succeed George Dacey as President, Sandia National Laboratories, on Feb. 1, 1986. President Dacey will retire on Jan. 31. Welber is currently Vice President, Transmission Systems at AT&T Bell Laboratories in Holmdel, NJ, with responsibility for design, development, and systems engineering of all transmission facilities. He was appointed to that position Aug. 1, 1981. Effective Oct. 1, he becomes a Director and Senior Executive Vice President of SNL.

Joining Bell Laboratories in 1950, he specialized in work on transmission systems, particularly microwave radio relay and computer techniques to increase the capacity of overseas telephone circuits. On the Telstar satellite project during the early 60s, he was responsible for ground communication equipment and technical planning with foreign participants in the experiment.

He was appointed Director of the Overseas and Microwave Transmission Laboratory at Holmdel in 1965, responsible for development of transoceanic submarine cable systems, waveguide transmission, and high-frequency radio and digital transmission on existing radio systems. In 1971, Welber became Associate Executive Director, and, in 1975, Executive Director, Transmission Systems - Merrimack Valley, with responsibility for the development of radio and wire systems for use in the Bell System Network.

In an interview last week, Welber told the LAB NEWS:

"In taking on this responsibility I am

most fortunate in being able to work with George [Dacey] during my first few months on this job. Sandia has earned and holds the respect of many key government people. I saw this firsthand during my recent visit to Washington, when I was introduced to them. The people of Sandia National Laboratories, because of their contribution to the nation's security, are viewed as a national resource. And George has been instrumental in projecting these contributions. In one of our meetings with someone who had not met George before, he was greeted with, 'It is an honor to meet a legend in his own time!'

"I view my new job as your president with considerable excitement and a little apprehension. I'd like to meet as many of the people of Sandia as I can and learn about their work. It is the tremendous variety and the job of Sandia in our nation's security that leads to the excitement. The breadth of technology that Sandia Labs encompasses will be my challenge to begin to comprehend.

"It is natural to ask — what prepared me for this position? If I fully understood the job, I could answer the question. But what I can tell you are some of things I have done that seem to relate to Sandia's activities.

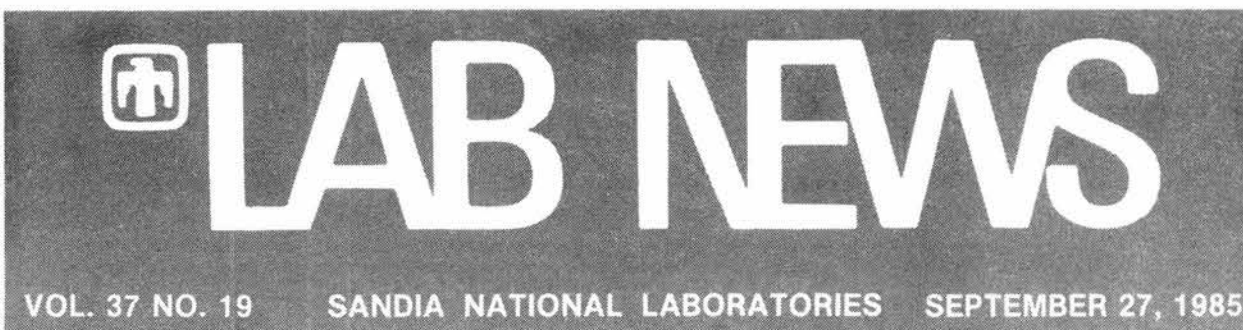


IRWIN WELBER

During the early 60s I dealt with NASA on satellite communications projects. Since that agency and AT&T were both launching their own version of a satellite in the same time frame, there were delicate negotiations required to meet a tight schedule for our Telstar satellite.

"For the past nine years I have worked with the National Security Agency [NSA] on enhancing the security of our Common

(Continued on Page Four)



Employee Contribution Plan Kickoff

Fifties Fun Furthers Funds for ECP

It's ECP kickoff time next Tuesday, and it's '50s style. Unpack those dirty saddle shoes (remember how they just *had* to be white buckskin, carefully scuffed so they appeared well worn?), blue jeans or peg pants, circle skirts, and angora sweaters.

Wear your '50s clothes, and join the crowd on the Library Mall at 11:30 for fun and entertainment. Emcees Vernon Koonce (5173) and Ben Ortega (3424) will set the scene with nostalgic music.

Do your thing in the Hula Hoop contest or the Dance Contest. You may win a cake, made and presented by a Sandia director. The Grand Prize winner will receive "A Trip to Sandia a la Dacey," — President Dacey will drive the winner to work one day.

Vote on your favorite United Way agency booth. The six SNLA vice presidencies have each adopted and decorated a booth.

At high noon, be entertained by "Dacey and the Crew Cuts" in a skit called "Eat Till It Hurts OR The Happy Days Crew Meets ECP." The setting is a booth at Arnold's, a hamburger joint and teenage hangout, run by Al. The cast includes: Al, George Dacey (1); Fonzie, Herb Pitts (3500); Richie, Art Davie (3000); Chachi, Lee Bray (30); Patsy, Bill Brinkman (1000); Ralph, Orval

Jones (5000); and Howard, Art Arenholz (30).

Lunches will be supplied by the Coronado Club: your choice of build-your-own hamburger or hotdog with all the trimmings, plus vegetable and fruit trays — for

\$2. Soft drinks and ice cream round out the menu at 50 cents each.

The ECP Campaign will be conducted Oct. 1 through Oct. 4. Join the kickoff on the 1st, and get in the swing for the Easy Community Participation drive.



IT'S CALLED "Getting into the 50s Mood for the ECP Campaign Kickoff Party on the Library Mall on Oct. 1." Sieglinde Neuhauser (6321) is Kickoff Committee Chairman and Ernie Aguilar (3425), also a committee member, is a United Way Loaned Executive. They urge employees to dress 50s style, enjoy the entertainment, and admire some of the classic cars that will be on display — like this 1955 Olds 88 (courtesy of Scott White).

Antojitos

Hail & Fare Well Thanks to the allure of early retirement, some familiar names are going to be missing from our masthead (the box below this one) next issue. Collectively, Norma Taylor, Louie Erne, and Don Graham have more than 90 years of Sandia service. And their retirement decimates our division: Don and Norma, with 28+ and 24+ years in Employee Information respectively, have put several hundred thousand words on paper for our readers, and they're walking compendiums of LAB NEWS policy and procedure; Norma is also the Labs' resident expert on Organizational Change Notices, Weekly Bulletins, etc. (With a mere 5.5 years, Louie is the junior member of the division, but he's been a Sandia photographer for 31 years.)

Needless to say, I'm going to miss them. I've spent nine years working with Don and Norma, more than three years with Louie. I wish them the best in retirement, but the LAB NEWS isn't going to be the same. (And thanks, Gerse Martinez, for not jumping ship no matter how attractive the tropical retirement isle appears.)

* * *

Bikes, Again Last issue's diatribe against those who appropriate the bicycles of others touched a sympathetic nerve in those on the side of law and order. (As might be predicted, few thieves called to complain publicly at having their intelligence slandered.) Ken Hueter (332) wrote that he has fixed a prominent sign -- STOLEN FROM KEN HUETER -- to his bike. "I occasionally get a fishy stare from a security inspector at the gate until he/she checks the name on my badge," he notes, "but my bike no longer disappears when my back is turned." Not a bad idea.

* * *

September Mourn This is, of course, the month when your boss calls you in to announce your raise, oops, your salary, for next fiscal year as based on your performance ranking, I mean, your contribution to the Labs, during the past year. Semantics aside (that's easy; I'm basically anti-semantic), the trouble is, when you've had a good year, the salary pot's tiny; when you've had a bad one, the pot's large. (Sorry, George, I'm just kidding.) ●BH

* * *

Adde parvum parvo, magnus acervus erit. (Latin: Keep adding little to little, and soon you will have a great heap.)

Hope Helps

Sandian's Son Aided

At least one Sandia family — Larry Bertholf's (8430) — can testify firsthand to the good work of a LEAP-supported agency, the Hope Education Center.

Larry and his wife Carol are volunteers at the Livermore nonprofit facility that serves all ages of people with neurological handicaps. The spectrum of client handicaps ranges from mildly learning disabled to nearly comatose conditions.

The Bertholfs' involvement centers on their 23-year-old son Gary, who was born with a learning disability that is related to an auditory perception problem. He spends three hours a day being patterned (using repetitious physical exercises) four days each week at Hope Education Center. Carol takes him there and assists with a variety of volunteer chores. "The Center is very much in need of help right now in all areas of the operation," she points out.

During Gary's year and a half at the Center, he has shown definite progress. "And we're so grateful to have a service of this kind close to home," Carol adds. "There is nothing like it in New Mexico, where we used to live, or elsewhere in northern California; in fact, the closest similar program is in Oregon."

Hope Education handles 15 to 20 clients at a time with only one program director, two part-time program assistants, and 10 to 15 volunteers.

Before moving to the Valley three-and-a-half years ago, the Bertholfs lived in Albuquerque, where Gary graduated from a special high school program that emphasized work experience as an integral part of its curriculum.

Gary notes that his physical exercise at Hope requires, among other things, traveling about a mile a day on elbows and knees. He also does his own patterning at home. For pastimes he enjoys fresh water fishing, playing pool on their home table, and "beating Dad at bowling occasionally."

Carol, who is on the board of directors for Hope, will be one of the volunteers staffing the agency's table during the noon hour LEAP kickoff next week. She will be glad to explain how employees can help through the Donor Option Plan or meet any number of material needs at the Center. All the people at the LEAP agencies tables are hoping for more interaction with Sandians this year, and most will be happy to sign up any Sandians who are willing to volunteer that day.

Medical Corner

Stress Management Lecture

Prof. Jack Curtis, University of Wisconsin, La Crosse, will talk on "Personalizing Stress Management," on Oct. 4 in the conference rooms of Bldg. 822 (outside the Tech Area) from noon to 12:45.

Curtis has authored three books in stress management. One of his books, *Learn to Relax: A 14-Day Program*, is in its fourth printing since January of this year. He also directs the University's stress management program that teaches health professionals how to teach stress management to others.



LAB NEWS

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SANDIA NATIONAL LABORATORIES

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LIVERMORE, CALIFORNIA
TONOPAH, NEVADA
AMARILLO, TEXAS

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STANDING IN FRONT of Hope Education Center in Livermore are the Bertholfs — Gary, Larry (8430), and Carol. Gary has made definite progress in overcoming his learning disability through Hope's patterning program.



LEAP Into Action Oct. 1

For Sandians, decisions on their charitable giving need be made only once a year — during the LEAP (Livermore Employees Assistance Plan) campaign.

LEAP allows employees to combine all their giving into one pledge, thereby helping to keep 29 local, Bay Area, and San Joaquin County human service agencies operating for the next year.

This year, Fair Share giving can be especially fun — albeit a bit wet for some. But more on that later; first a word from the LEAP chairman: "Sandians have something to be proud of when it comes to raising funds for the organizations that provide valuable services to our communities. With government support for all agencies decreasing, it is even more important to help maintain the essential services these groups provide," says Mike Birnbaum (8243).

Last year Sandians gave \$105,000, with about 82 percent making a pledge. The goal for this year is a four percent increase to raise a total of \$109,000.

The focus of the campaign kickoff for '85 will be the LEAP Faire on Oct. 1 at the Combustion Research Facility patio. The Faire will be an opportunity to meet representatives from each of the 26 local agencies supported by LEAP, in addition to the United Way of the Bay Area and San Joaquin County, and the California Combined Health Agencies. While taking a look at the charitable groups' presentations, employees will be offered hot dogs, popcorn, and soft drinks at lunchtime.

Once again there will be a LEAP Fun Run/Walk, organized by the Sandia Employees Recreation Committee, at 11 a.m.

Now for the new attraction this year: It's the chance of a lifetime — a dunktank for lab management! Those Sandians pledging a Fair Share (0.6 percent of gross pay or approximately one hour per month) or more *that day* will get a free ball toss at the target. Hitting it means a dunk for any Livermore director or vice-president Dick Claassen (8000).

The solicitations will be handled differently this year. Each directorate will hold an assembly for all its employees and present information on the LEAP agencies. There will be instructions for completing the pledge cards and for making donor options. With the Donor Option Plan, a person may designate a pledge to go directly to any human service agency of his or her choice. Undesignated pledges will continue to be allocated among the 29 groups selected by the LEAP committee.

There are eight new agencies being supported this year: Centro Hispano, Eden Express Restaurant, Family Tutorial Program, Nautilus, New Horizons Nursery School, Northern California Society for the Prevention of Blindness, Parental Stress, and Valley Counseling Center.

The 18 groups receiving continued support include the Agency for Infant Development, American Indian Center,



VISITING THE AMERICAN INDIAN CENTER, a United Way-supported agency in Livermore, were three LEAP committee members. From left are Indian Center student Mike Edwards explaining his costume, his mother Doris Edwards, center director Mary Puthoff, volunteer Margie Thomas, and LEAP members Cindy English (8201), Belva Mayfield (8264), and chairman Mike Birnbaum (8243).



SANDIA LIVERMORE NEWS

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Buenas Vidas Youth Ranch, The Center, Emergency Fund Center, Family Crisis Services, Hope Hospice, Hope Education Center, Horizons Youth & Family Services, Kaleidoscope, LAGATS, Livermore Play Schools, M2 Sponsors, MATCH, Nursery School Scholarship Fund, Nurses Welfare Fund, Tri-Valley Community Fund, and Twin Valley Learning Center.

Among those working with Mike on the LEAP committee this year are deputy chairman Jim Woodard (8432), past chairman Bill Ormond (8311), Scott Anderson (8100 representative), Belva Mayfield (8200 representative), Rob Allen (8300 representative), Norm Wagner (8400 representative), and Kit Marino (8184 and Machinists and Aerospace Workers Union representative). • Karin Mohr (8201)

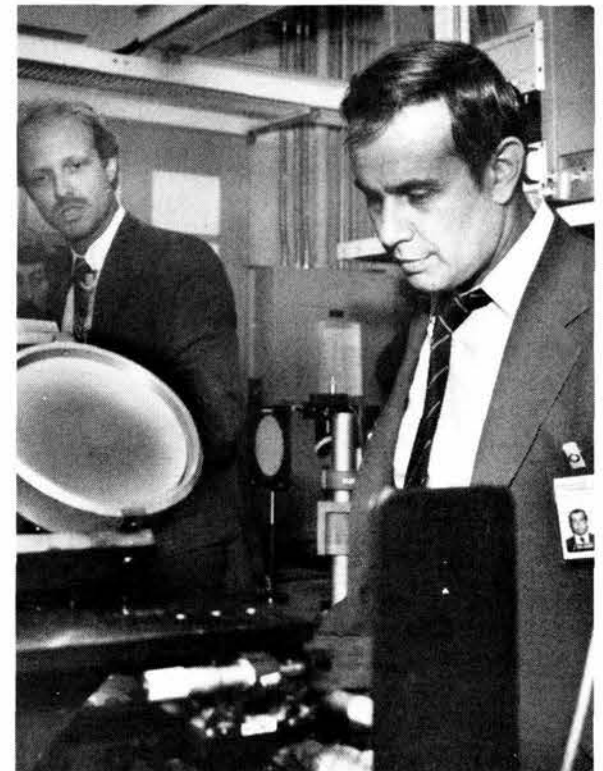
Electronic Isolation



Computers are great for relaying information, but they're not much on conversation. Researchers at the Organizational Behavior Institute reported recently that new work styles, by which workers transfer information via computers rather than in person, threaten to reduce productivity with too much isolation.

Studies showed that people work more effectively when they can interact with others in the course of their duties. Productivity increases when workers feel they are a part of a team.

Journal of American Insurance



DOE UNDERSECRETARY Joe Salgado came to Sandia Livermore for a briefing and short tour on Sept. 11. Here Mike Dyer, supervisor of Combustion Applications Division 8362 (center), shows him the CARS engine experiment in the Combustion Research Facility. Salgado also learned about Sandia's engine knock research.



SEPTEMBER RETIREES at Sandia Livermore include (from left) Ben Turpin (8184), Sy Mayer (8182), Arley Turner (8184), Michael Schalit (8024), and Curt Franklin (8163).

'Goal Is Conservative' — Pitts

\$1,050,000. That's the goal for the 1985 ECP campaign.

Herb Pitts (3500), ECP Committee chairman, says it's a conservative figure compared to last year's outstanding results — \$133 thousand over the one million dollar goal.

"But that was based on a higher level of employment," says Herb. "This year we based our figures on a lower employment level because of the large number of retirements," Herb says. "But the ECP committee has a lot of confidence in Sandians and their ability to meet or even surpass this goal."

"That confidence is not based just on wishful thinking — Sandians have always been extremely generous with both their time and money when it comes to community involvement. I think that employees are proud of ECP and the support it provides for the community. That feeling probably stems from the fact that we have been able to maintain ECP as a separate, viable entity — not an extension of the United Way organization. Employees recognize this, they know they're doing a good job, and they're proud of it."

Last year, Herb served on a UW Special Projects Committee engaged in identifying alternative methods for funding national health agencies. Through the work of this committee, and negotiations between UW and the concerned agencies, six of eight national health agencies supported by ECP in the past will receive some UW funding.

Employees may choose to direct their contributions to an organization of their choice through the Donor Option Plan. Under this plan, UW receives the ECP funds and makes the distributions requested by individual employees.

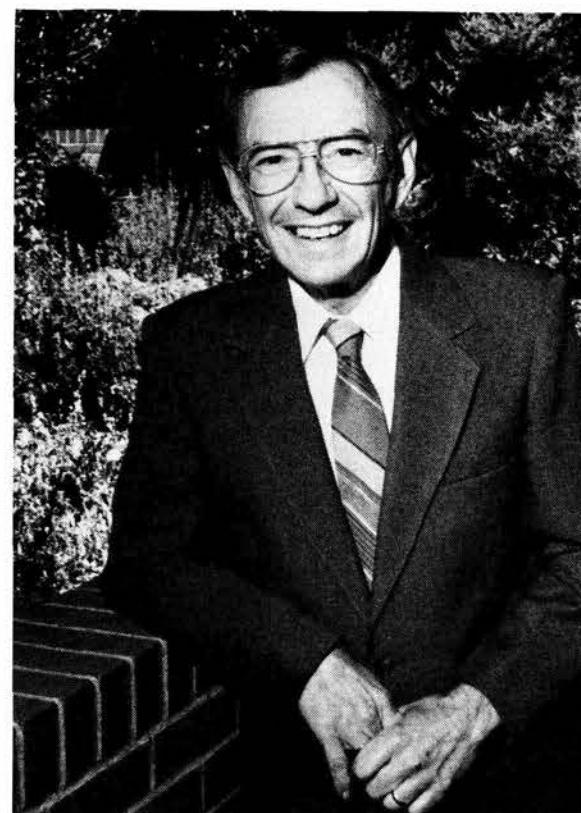


HERB PITTS (3500)

"Another feature of ECP is the reserve fund, which, this year, has been increased to one percent. The reserve fund is for one-shot emergencies," Herb says. "We have been able to meet some specific critical needs in the community with this fund."

"We would like to see an increase in Fair Share [0.6 percent of salary — one hour's pay per month] giving," Herb adds. "Total participation is up, but a Fair Share amount from everyone would help meet those health and human care needs that are still unmet."

"See you at the ECP Kickoff next Tuesday. I'm practicing for my part as The Fonz, so here's a thumbs up and 'Aaaayy.'"



BOB WILDE (3430)

Supervisory Appointment

BOB WILDE to manager of Plant Security Department 3430, effective Aug. 16.

Following graduation from Montana State University with a bachelor's in EE, Bob joined the Labs in July 1958 as a design engineer with a weapons group. He worked in weapons design for 15 years, then became a charter member of the newly organized safeguards security group. He was promoted to supervisor of the Transportation Systems Division in October 1975. Most recently, he's headed Communication Systems Division 5215.

Bob enjoys carpentry and auto repair projects, and is currently completing construction of a cabin near Durango, Colo. He and his wife Donna have three grown children and three grandchildren. They live in the NE heights.

Continued from Page One

Welber Named President

Carrier microwave systems. Most recently, we have bid and been awarded a development contract by NSA for an advanced version of a secure telephone. This will be known as STU III [Secure Telephone Unit] and will be capable of use on the switched network. The major part of my

Welber 9th Sandia President

Paul Larsen (director) 1948 - 1949
George Landry 1949 - 1952
Donald Quarles 1952 - 1953
James McRae 1953 - 1958
Julius Molnar 1958 - 1960
S.P. "Monk" Schwartz 1960 - 1966
John Hornbeck 1966 - 1972
Morgan Sparks 1972 - 1981
George Dacey 1981 - 1986

time at Bell Labs, however, has been occupied with the design of the transmission network for the Bell System and now AT&T."

A native of Amsterdam, NY, Welber received a BS in EE from Union College (Schenectady, NY) in 1948 and an MEE degree from Rensselaer Polytechnic Institute in 1950. He holds two patents. He is

a Fellow (1973) in the Institute of Electrical and Electronics Engineers and a member of the American Association for the Advancement of Science, the New York Academy of Sciences, and IEEE. He has served as a member of the University of Massachusetts' Dean's Advisory Council, and the IEEE Communications Society Policy Board.

Welber says that although he isn't familiar with Albuquerque, he isn't a stranger to the Southwest. In his early years with Bell Labs, he completed several assignments in Denver. One of his sons attended the University of Arizona, and he and his wife, Ellen, have often visited friends in Arizona.

The Welbers have three sons, all married. Mr. Welber enjoys golf, reading, and tennis. "I haven't played tennis for a few years, but perhaps, with what I've heard about the fine weather in Albuquerque, I'll start looking for a tennis partner," he said. "I'll be attending a meeting of Sandia's Large Staff soon, and I'm eager to begin meeting some of the people I'll be working with."

Welcome

Albuquerque

April Howard (2149)
Arba Smith (2632)
Anita Wilson (134)

California

James Bailey (1234)
Robert Barlow (6221)

Michigan

Karl Halter (2362)

Montana

Stephen Robischon (1251)

New Mexico

Rita Sampson (2632)

Oregon

Richard Blake (1124)

Texas

Kenneth Bercaw (7842)
Mark Grohman (5347)

Wisconsin

Kevin O'Brien (1241)

Take Note

The Third Symposium on Space Nuclear Power Systems will be held in Albuquerque at the Marriott Hotel on Jan. 13-16, 1986. Purpose of the symposium is to provide a national forum for sharing of information and transfer of technology among the planners and potential users of space nuclear power systems.

The agenda includes space nuclear missions and applications, radiation effects, testing, thermal management, systems integration, space reactor fuels, nuclear electric and nuclear propulsion, technical exchange, radioisotope generators, nuclear safety, energy conversion, reactors and shielding, fabrication and availability of refractory alloys, control/power conditioning and distribution, refractory alloys and development, advanced multimewatt systems concepts, and mechanical properties and effect of irradiation on refractory alloys. Classified sessions will be held Jan. 16 at KAFB. Two short courses on High Temperature Heat Pipes and Radiation Effects in Electronics will be offered in conjunction with the symposium on Jan. 9-11 at the Marriott.

The symposium is sponsored by the Institute for Space Nuclear Power Studies of UNM and co-sponsored by the ANS Trinity Section, LANL, SNL, and the Air Force Space Technology Center.

For more information contact Prof. Mohamed S. El-Genk, UNM, Technical Chairman, 277-5442. For reservations and exhibits, call Patricia Quinn, Chemical and Nuclear Engineering Dept., UNM, 377-0446.

* * *

The Laser Safety Institute offers a one-day Laser Safety Short Course to be held at the Los Alamos Inn from 8 a.m. to 5 p.m. on Oct. 7, 8, or 9 (choose one). Instructor is D.C. Winburn (LANL), author of "Practical Laser Safety," which is the text book used for the course. (The book is available locally; call 265-3431.) For more information, write D.C. Winburn, 348 Andanada, Los Alamos, NM 87544, or call 662-7372.

* * *

An exhibit on the Cuban Missile Crisis will open at the National Atomic Museum on Oct. 15 at 10 a.m. The exhibit includes a lobby display, films, and a speaker on the 15th to observe the 23rd anniversary of the Cuban Missile Crisis. General Ernest Hardin, Assistant to the Manager of Albuquerque Operations Office, was assigned to the Pentagon during the historical 14 days in October 1962. He will relate his personal experiences and recollections of the crisis.

* * *

Parentcraft, a division of Family and Children's Services, offers workshops for parents, educators, and childcare providers. Workshops will be held at the Parentcraft Center, 114 Carlisle SE, through Nov. 23. Daytime and evening workshops are offered. A schedule of the workshops offered is available by calling 256-1191.

* * *

The Albuquerque Gallery Association will showcase Albuquerque galleries and the artists and craftsmen they represent on Sept. 28 and 29 at the Fine Arts Gallery,

State Fairgrounds. The display is free to the public from 1 to 5 p.m. each day

* * *

Fire Prevention Week — Oct. 6-12 — is being celebrated on KAFB with a number of activities: A poster contest, fire prevention education display contest, a fire extinguisher training contest, and a Fire Prevention Ball. The Ball will be held at the Enlisted Club, Oct. 11, and includes cocktail hour, dinner, entertainment, and dance band. All activities are open to Sandians. For more information call 4-9616.

* * *

Sue Henderson (6420) and Estelle MacKenzie (5210) have each been designated a Certified Professional Secretary (CPS) by the Institute for Certifying Secretaries, a department of Professional Secretaries International (PSI). The women achieved the CPS rating by meeting educational and work experience requirements and by successfully completing a two-day examination, covering behavioral science in business, business law, economics and management, accounting, office administration and communication, and office technology.

* * *

Albuquerque has been selected as the site for a public forum on future civilian space goals. The forum, conducted by the National Commission on Space, Washington, D.C., will be held Oct. 4 at the Albuquerque Public Library, 501 Copper NW, starting at 9 a.m.

Purpose of the forum is to solicit opinions from the general public, industry, and academia concerning long-range goals for U.S. civilian space activity to the year 2035. Commission forums are scheduled in 15 selected cities across the country over the next several months.

Legislated by Congress to study existing and proposed space activities, the National Commission on Space will prepare a final report detailing its findings for presentation to the President and Congress next March.

For more information, call (202) 453-8685.

* * *

The Sandians, an organization of wives of Sandia employees, female employees, and wives of associated contractors, has issued a call for new members. The club provides educational and social activities for members and helps introduce newcomers to Albuquerque.

The group meets on the first Monday of the month at a member's home. A babysitting cooperative and a gourmet cooking sub-group are features of the club.

If interested in receiving a newsletter or additional information, call Linda Manke, 293-6064.

* * *

"The Art of Ballooning (It's More Than Just a Lot of Hot Air)" is the topic for the American Institute of Aeronautics and Astronautics' October meeting. Mike Banovsky, owner and pilot of the Tequila Sunrise Balloon, will talk about balloon designs, getting a pilot's license, what the pilot and crew are doing during inflation and flight, how balloonists compete, and the history and methods of hot air ballooning.

The meeting will be held Oct. 3 at the



PAIR OF PRIZES went to Bonnie Skenandore (3155) for the two works she entered in the Indian Art competition at the State Fair. The top one, "The Onlooker," won a second premium; the other, "The Shuswap," an honorable mention. Both were done in Prismacolor (colored pencil) highlighted with acrylics.

UNM Geology Dept. Offers Public Seminars

A Seminar Series, sponsored by UNM's department of geology, offers free public presentations this fall in room 122 of Northrop Hall at 11 a.m., as follows:

Oct. 3 — "Regional Geophysics of the Rio Grande Rift: A Global Perspective," Randy Keller, geological sciences department, University of Texas at El Paso.

Oct. 10 — "Does Free Water Exist in the Intermediate and Deep Crust?," Thomas Shankland, LANL.

Oct. 17 — "Atmospheric History Presented in a Stone," James Walker, a UNM-Sandia distinguished lecturer from the department of atmospheric and oceanic science, University of Michigan at Ann Arbor.

Oct. 24 — "Applications of Transmission Electron Microscopy to Geologic Problems," Ian Mackinnon, UNM geology department.

Nov. 7 — "Drilling Very Young Igneous Intrusions," John Eichelberger, Geochemistry Division 1543, SNLA.

Nov. 14 — "Geochemical Constraints on the Origin of Continents," Kent Condie, department of geoscience, NMIMT.

Nov. 21 — "The Dangers of Asbestos in our Environment: Separating Fact from Fiction," Malcomb Ross, experimental geochemistry and mineralogy, U.S. Geological Survey, Reston, Va.

Dec. 5 — "Stratigraphic Crystallography," James Thompson, Jr., UNM's Caswell Silver distinguished lecturer from the department of geological sciences, Harvard University.

For more information, contact the UNM geology department.

KAFB Officers Club West. A social hour begins at 5:15 p.m. (no-host bar, snacks, sandwich line for \$4), and the presentation begins at 6:15 p.m. For more information contact Walter Rutledge (1635), 4-0119; or Craig Jones (1651), 6-5992.

New Ion Accelerator Demonstrated

A conventional linear accelerator must be more than half a mile long to produce ions in the 1 GeV (billion electron volt) range. But a fundamentally new concept in particle acceleration that could reduce that length a hundredfold or even a thousandfold has been invented by Craig Olson of Plasma Theory Division 1241.

Craig and the project team that helped him develop the new Ionization Front Accelerator (IFA) device believe the concept may lead to small and relatively inexpensive accelerators for medical, scientific research, and military uses.

The key to the concept is a new method for accelerating charged particles to high energies. The device uses the electric field naturally produced near the front of an electron beam to continuously attract and accelerate a spherical bunch of ions. These ions are accelerated to very high energies in a very short distance as the front is moved with the aid of two lasers.

What should make the IFA attractive to researchers is that a relatively small amount of laser energy can control an electron beam that might have more than a thousand times the energy of the lasers.

Two versions of IFA have been tested. The most recent, IFA-2, accelerates ions along a tube 30 cm (12 inches) long, accelerating protons to 5 million electron volts (MeV), deuterium ions to 10 MeV, and helium ions to 20 MeV.

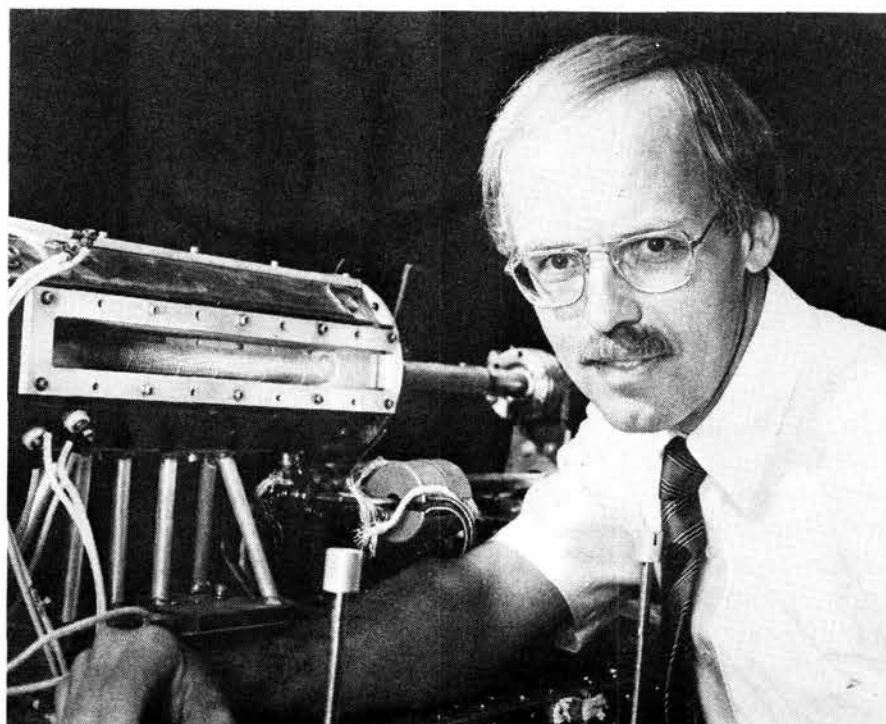
But the team thinks that the device could be scaled up — uprated to produce ions in the 1 GeV range, or even much higher. "We believe that an acceleration length between 3 and 33 feet [1-10 metres] would be enough to produce 1 GeV protons," says Craig. "That's a hundred to a thousand times shorter than the distance it takes a conventional linear accelerator to produce protons as energetic as this."

If such machines are fully developed, they conceivably could be used for such varied applications as high energy physics studies, an intense neutron generator, or a heavy ion driver for fusion experiments. They also could produce heavy ions or protons for cancer therapy or radiography in small medical labs. In radiography, such particles can reproduce soft tissues in better detail than conventional X-rays can.

The IFA was based on Craig's earlier theoretical work on a related, naturally occurring process. In the natural process, a high current electron beam is introduced into a metal tube filled with a low pressure gas. The beam has so much negative charge that it cannot move down the tube unless it ionizes the gas.

And that's exactly what happens. As the beam ionizes the gas (dislodges electrons, leaving it positively charged) so the beam can propagate down the tube, ions are attracted to the negative charge at the beam front. Then they become trapped by the electrical charges and move at constant velocity along with the beam front.

In the IFA, this process is precisely controlled with lasers that provide a constant acceleration of the beam front. In IFA-2, a fixed laser excites cesium gas contained in-



WITHIN THIS TUBE Craig Olson (1241) and his project team showed that the concept of an "ionization front" accelerator was workable. Device used lasers and a powerful electron beam to accelerate a spherical bunch of ions down the tube.

side the tube; then an electro-optic crystal deflector sweeps a second laser along the tube, photo-ionizing the excited cesium. The second laser beam starts at rest at the beginning of the tube, and is programmed to sweep across the tube at one-tenth the speed of light (18,600 miles per second) when it reaches the end of the tube, just a foot away.

"With IFA-2 we have demonstrated that a controlled collective accelerator can produce an accelerating field of 33 megavolts per metre over a 30-centimetre distance," says Craig. "These are the first such results for collective accelerators or laser accel-

erators, so they represent a significant milestone in the development of particle accelerators." (Conventional accelerators apply voltage across gaps and force atomic particles to jump the gaps; collective accelerators use fields of electron beams that have, in essence, a moving gap, so the acceleration is continuous.)

In addition to Craig, the the IFA team included Jim Poukey (DMTS, 1241), Edward Patterson, Willie Jaramillo, Gary Samlin (all 1244), Charles Frost (1272), and John Anthes (2531). IFA-2 research was supported by DOE's Division of Advanced Energy Projects and by its Defense Program.

More on Particle Accelerators

Particle accelerators come in a bewildering variety of shapes and sizes. The electron gun that paints moving pictures on a TV set is a kind of particle accelerator. So is the proposed "Superconducting Supercollider," designed to probe deep into the secrets of elementary particles within an atom, which would be large enough to encircle New York City.

These machines perform many tasks, ranging from basic nuclear research to the production of radiochemical substances for medicine. Sandia began using particle accelerators in the 1950s to simulate some of the effects of nuclear weapons, and since that time has become expert in designing special-purpose machines such as those used in our inertial confinement fusion, weapons effects simulation, and directed energy weapon studies. The many accelerators in Pulsed Power Directorate 1200, which are designed to produce X-rays, high-energy ions, and gamma rays, operate at up to 30 million electron volts. The seven smaller accelerators in Department 1110 are helping our scientists and engineers to learn more about ion implantation and radiation effects on materials.

Particle accelerators have two main things in common. First, they have a means of producing charged particles — electrons or ions. Second, they have a

means of accelerating these particles through a drop in potential, as from a positively to a negatively charged plate.

Particle acceleration occurs when there are lightning flashes — and when the concentration of electrons that we call static leaps from a fingertip to join the positive charges in a steel desk. When this happens, you and the desk together are sharing the discomfiture of *being* a particle accelerator.

Conventional accelerators include two or more fixed electrodes, and particles are accelerated whenever they pass between two electrodes held at different electric potentials. The ionization front accelerator (IFA) differs radically from this concept in that it has no electrodes — the potential drop is produced by moving negative charges.

The energy of accelerated ions and electrons is described in terms of electron volts (eV) instead of, say, velocity in kilometres per second. While the ordinary volt is a unit of electric potential, the eV is a unit of energy or work; technically, it's the kinetic energy gained by an electron as it moves through a potential difference of one (ordinary) volt. At 5 million eV, the new IFA's protons are traveling at about 10 percent the speed of light (approximately 16,800 miles per second).

Community Focus Program Debuts Next Month

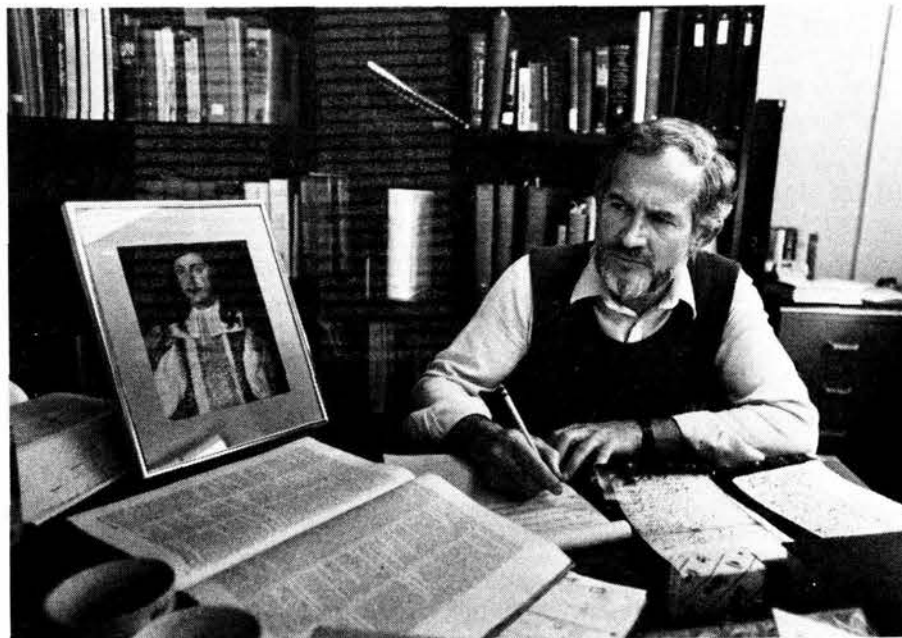
A new series of forums — the Community Focus program — will bring guest speakers to the Labs to discuss issues and topics of concern and interest to employees. Karen Shane (3163) is the coordinator.

Speakers will make presentations during the lunch period at either the Technology Transfer Center or Bldg. 815 theater on a bi-monthly basis.

The first scheduled speaker will be John Kessell, professor of history at UNM and editor of *The Vargas Project*. Kessell is making his second appearance as a lecturer at Sandia; in 1980 he spoke before a large audience on his new book, *The Missions of New Mexico Since 1776*. His new topic, "The Quest for a Vital Diego de Vargas," relates his efforts and experiences to track down the "journals" of Diego de Vargas. Kessell has been working on the project since 1980. His goal is to find the scattered journals (some 2500 original pages are part of the Spanish Archives of New Mexico in Santa Fe; lesser holdings, with complementary civil and ecclesiastical materials, are housed in a dozen Spanish, Mexican, and U.S. archives) and to publish them in a six-volume English translation, with a variety of supporting documentation.

Kessell will speak to Sandians at 12 noon on Oct. 8 at the Technology Transfer Center.

On Dec. 10, Wilson Hurley will talk about "Creativity" at the second Community Focus program. Hurley is a landscape ar-



JOHN KESSELL (UNM) will discuss *The Vargas Project* at the first Community Focus program on Oct. 8. Kessell has been searching for the de Vargas journals since 1980. When the project is completed, the journals — transcribed, collected, translated, annotated, and published — will broaden our understanding of Spain in America, of how Indian and Spaniard co-existed in an environment of limited resources, and of how their legacy contributes to America's plural society today.

tist who last year won the \$100,000 Prix de West at the Cowboy Hall of Fame in Oklahoma City. He is also a former engineer at Sandia, has been a local attorney, and was a jet fighter pilot in Viet Nam. More than 50 of his paintings are currently featured in an exhibition at the Albuquerque Museum.

A tentative schedule of future Community Focus programs includes "Home Security Seminar"; "You and Your Aging Parent"; "Ecology of the Sandias"; "What's a Parent To Do? — Drinking at High School Proms and Parties"; and "Teenage Drug Abuse."

Fun & Games

Tennis — The Sandia Tennis Association has called a "Fun Mixed Doubles Tennis Marathon and Picnic" for Saturday, Oct. 5, starting at 9 a.m. Here's the idea: sign up for a day of tennis-playing, meet at the Coronado Club courts, draw (or something) for partners and opponents, bring a lunch, bring the family, and have a lot of fun. Entry fee for STA members is \$3. Carol Brinkman, 298-9389, has details.

* * *

Golf — Winners of the recent SGA Paradise Country Club tournament were Robert Wood (3732) and Dave Salas (2601), Flight I; Howard Cilke (5242) and Mel Vick (ret.), Flight II; Goldie Lane (ret.) and Lou Aragon (ret.), Flight III; and Ed Bishop (5123) and Manuel Chavez (5232), Flight IV.

* * *

Soccer — A picnic for all soccer players and anyone who might be interested starts at noon tomorrow in the Coronado Club patio. Bring your lunch, the family, and your ideas about soccer-playing at Sandia. Beverages, chips, and dips will be provided.

* * *

Aerobics — A new aerobics class starts at the Coronado Club Oct. 2. It will meet Mondays and Wednesdays at 5 p.m. Instructor is Terry Martinez (1250); for details call 6-7806.

* * *

Biking — A number of Sandians participated recently in the Red River "Enchanted Circle — Wheeler Peak Century." The 100-mile bike tour started at Red River, continued through Taos, Angel Fire, and

Eagle Nest in the Sangre de Christo Mountains, and returned to Red River. Included in the group were Otto Van Geet (7843), Mike Lucero (7812), Paul Schlavin (7843), Vern Duke (7862), Fred Shwiller (7815), John Medernach (2149), Marcel Hesch (7474), Ray Bland (7475), Barbara Surbe (7831), Jack Bartberger (322), Jim Garton (5234), Bob Roginski (7553), and Ray Patrick. Making a 50-mile version of the trek were Paula Painter (7864) and Rose Cordova (7832).

* * *

Running — The long-awaited "Lab-to-Lab Relay," held last Saturday, saw Los Alamos National Lab teams taking first, fourth, and seventh places; KAFB second; Sandia third and fifth; and DOE sixth. Each team had 10 runners, including two women, two runners over 40, and one over 50. Each team member ran one leg, which varied from 8.4 to 10.2 miles, of the 91-mile course from lab to lab. The course began (at 5 a.m.) at Sandia, went through Tijeras Canyon on old Highway 66, up North 14, across I-25 on Highway 22 through Cochiti and Pena Blanca, then took St. Peter's Dome Road to Highway 4, left 4 on American Springs Road, and came out on West Jemez Road just outside LANL. Winning time was 9 hours 46 minutes. KAFB came in at 10:34, Sandia at 10:37. Henry Dodd (6225) was the honcho on this end, John Cappis on the LANL end. "It was fun in spite of our loss," says Henry. "Great camaraderie among all the runners. I hope we can do it again next year and maybe change the order of winners."

Events Calendar

Sept. 29 — Movietime at the KiMo — Love to Laugh Series: "Night at the Opera," American (1935), The Marx Brothers, 7 p.m., KiMo.

Sept. 29 — Southwest Pickers Fall Festival of Music, 2 p.m., at the ballpark in Madrid, 1-471-7490.

Sept. 29 — Albuquerque Philharmonia Orchestra Fall Concert; Willy Sucre, conductor; Frank Bowen, flute soloist; 3 p.m., KiMo.

Sept. 29-30 — San Geronimo Feast Day: Sundown dance on 29th; ceremonial foot race, pole climb, arts & crafts, various dances on 30th; Taos Pueblo, 1-758-8626.

Oct. 3, 5, 11-12, 17-19 — "Broadway — Now and Then," musical revue presented by the Cabaret Company, 2nd Story Center, Albuquerque Little Theatre, 8:15 p.m., 292-5363, 298-8823.

Oct. 4 — San Francisco Feast Day, various dances, Nambe Pueblo, contact pueblo.

Oct. 4, 6, 8, 12 — "Die Fledermaus," 8:15 p.m. & 2 p.m., KiMo, 243-0591.

Oct. 5-6 — Antiques show and sale, Soroptimist International, 10-5, Old Albuquerque Airport (Yale SE).

Oct. 5-13 — Albuquerque International Balloon Fiesta, Cutter Launch Site (off I-25 north, between Osuna & Los Angeles, just west of freeway), 344-3501.

Oct. 6 — Movietime at the KiMo — Boy Meets Girl Series: "Smiles of a Summer Night," Swedish (1955), Ingmar Bergman, English subtitles, 7 p.m., KiMo.

Oct. 8 — Maxie Anderson-Ben Abruzzo International Balloon Museum Barbeque Benefit: Anderson Valley Vineyard Winery, Powdrell's barbeque; Watermelon Jug Band, 4920 Rio Grande Blvd. NW, 4:30-7:30 p.m.; \$35/couple; \$20/person, \$10 children 10 & under, 247-8900.

Oct. 10-12 — "Under Milk Wood," 8 p.m., Albuquerque Little Theatre.

Oct. 11 — Blue Notes: Alan Lewine Sextet, original mainstream jazz, 8 p.m., KiMo.

Component Development VP Retires

Before John Galt (2000) accepted his first position at Sandia (director of solid state sciences research) in 1974, he asked some of his compatriots at Bell Labs whether Sandia had the kind of technical people he would enjoy interacting with.

"They said 'yes,' and they were right," says John. "I've missed Bell Laboratories, but I've certainly enjoyed this place very much. Perhaps that's because Sandia today resembles the Bell Labs that I knew from 1948 until I came here 26 years later — talented people performing challenging work."

When John retired last month, he had served Sandia for four years as a director, six years as vice-president of research, and one year as vice-president of component development. At Bell Labs (now AT&T Bell Labs), he headed the solid state and plasma physics department from 1957 to 1961, then replaced George Dacey as director of the solid state electronics research lab when George left to serve his first term at Sandia.

In looking back over his Sandia career, John tends to be low-key about his contributions as a member of Small Staff. "Today we're privileged to enjoy the fruition of a couple of policy decisions made well before I became a vice-president," John notes. "One was the decision made under President Molnar [1958-60] to reach out beyond the purely engineering work and engage in some exploratory research. This research, in solid state physics and in other areas, has led Sandia beyond the narrow confines of weapon technology to the point that we were able to contribute significantly to the nation's energy program. And I expect that Sandia will soon play a major role in developing advanced conventional munitions."

"The other decision came when President Sparks headed the labs [72-81]. Small Staff decided to make Sandia into a multi-program laboratory, not only a weapon lab. Without that decision, Sandia would have become a very shriveled kind of place. But as a multi-program lab, we could respond without a great deal of upheaval to, for example, the Reagan administration's decision to cut back the energy programs and emphasize the weapon programs."

"So I believe that currently Sandia is a healthy lab that manages its programs with vigor and confidence. It's respected in Washington — where it's perceived as a very useful institution that can be asked to do all sorts of things and do them well — and throughout the country as well. We've managed to mature without atrophying."

Asked to name some of the Sandia achievements under his leadership that he believes are, or will be, most significant, John divided his answer into periods tied to his three management positions. From his years as a director, he mentions the emergence of asymmetric encryption, "which was not invented here but which Gus Simmons [1640] moved vigorously into system application and which has had significant impact on Sandia systems."

He also mentioned the work of Mike Knotek (formerly 1134, now director of the

National Synchrotron Light Source at Brookhaven) and Peter Feibelman (1151) on the theory of stimulated atomic desorption — "certainly a landmark in our program," says John.

Another example, "a very significant effort" in John's words, is Tom Bergstresser's (1531) and Bill Davey's (1533) development of computer codes that model the effects of a near-surface nuclear explosion on the earth near the explosion.

"I'd say that the biggest single achievement to come out of our research efforts in 1000 when I was the vice-president was the strained-layer superlattice," John notes. "But there was also some awfully good work done by Wayne Goodman [1134] on the relation of surface science to practical catalysis."

Another effort John mentioned, one that "started before I took over and isn't ended yet," is the maneuverable reentry vehicle, SWERVE, "a very significant program in terms of Sandia's capabilities of and by itself and also as a harbinger of the future. It's in a class by itself, and it has significant potential for the country's military capability."

The brevity of John's stint as vice-president of component development means that it's difficult to identify any accomplishment in terms of his leadership — "My era in 2000 hasn't been long enough." But he feels that several accomplishments begun before he arrived and likely to continue after he leaves are worth noting. One is the start of construction on the RHIC (radiation-hardened integrated circuit) lab — "an important element of Sandia's future. Integrated circuit technology also is moving forward vigorously."

On the subsystem level, John feels that SANDAC (SANDia Airborne Computer), especially SANDAC IV (LAB NEWS, Aug. 16, 1985), and the quartz accelerometer (LAB NEWS, Feb. 1, 1985) deserve mention.

John spent some time reflecting on Sandia's impact on society as a whole. He feels that the Labs has succeeded here, partially — or even primarily — because it identifies itself as an engineering lab rather than as a research lab. The research labs "have ranged over a wider variety of fields [than Sandia]. But when you ask about programs that have blossomed into major successes — in the sense that others have picked up the work and carried it on — I think we are able to point to both a broad and a large successful set of programs."

John listed several programs that meet his definition of "successful." One is the windmill program, specifically the VAWT (vertical axis wind turbine) that's been adopted by commercial firms that build "wind farms" in appropriate locations around the world. Another is the "downhole" and other "enhanced oil recovery" work that Sandia has performed over the last decade or so: improved drill bits, a downhole steam generator to soften heavy oils for pumping, a solution to wellbore refluxing, and other improvements that have been picked up by the people in the oil/gas patch.



JOHN GALT (2000)

Another example of Sandia success is the engineering design for the WIPP (waste isolation pilot plant), which is now under construction near Carlsbad.

John also mentioned Sandia's work in harnessing solar energy: "We are in many ways the most successful laboratory in the whole solar program. We're now very much the center of it; as far as I'm concerned, that concentration here is based simply on competent performance. The work we've done in solar is permanent gain — I think there will be quite a bit of solar energy used in the long run because I believe the day will come when oil will be prohibitively expensive, maybe not \$100 a barrel but \$60 or so. And at that point windmills and solar cells are going to look a lot better than they do today. Yes, I think that the day will come when Washington will reemphasize the energy program. We are trying to manage the Labs so that, when that happens, we'll be ready and able to respond."

Asked to predict future successes in getting technologies transferred to industry, John becomes a bit cautious: "I do think that the Center for Radiation-hardened Microelectronics will lead us in a direction corresponding to the technological needs of this society in the future. And it's my opinion that further developments of quartz crystal technology, beyond the accelerometers and timers we're now working on, will eventually have commercial applications."

"I also think Sandia is doing some interesting work in optics; of course, optical electronics are moving vigorously outside Sandia too, but I predict that our optics program will someday make contact with our strained-layer superlattice program and that merger will lead to some exciting new applications both inside and outside the Labs."

John is leaving Sandia Oct. 1 with the general goal of a busy retirement but no specific plans. He may do some consulting or seek "a job with some technical content, but I have at present no commitments of any kind." He also plans to catch up on his reading and on his understanding of computers: "In spite of my position in 2000, I've not become an expert on computer science or technology — computers came in when my career was already pretty far along. What I will try to do, no matter what, is to get enough of a mastery of computers so I can use one for some of the things they do so well. That is certainly not going to make me an authority in the field, but computers are a factor in this society from which I'm not eager to be completely isolated."

Marx Generators Pass Tests

The source power for Sandia's new Particle Beam Fusion Accelerator II (PBFA II), nearing completion in Area IV, has been installed and successfully test fired in the accelerator. This means a considerable portion of the accelerator is now already installed and tested.

PBFA II will be the world's most powerful particle beam fusion accelerator.

PBFA II's circular array of 36 capacitor banks, known as Marx generators, were fired both individually and together as a system in a comprehensive series of tests. The Marxes met all performance expectations: they generated a combined production capability — for a millionth of a second.

The array makes up the outer ring of the 108-foot-diameter PBFA II. The first test shot of the entire PBFA II accelerator should take place before the end of January 1986. According to Tom Martin, manager of Pulsed Power Systems Department 1250, the successful tests of the Marx generators were completed earlier than predicted and keep the project well on schedule.

PBFA II is designed to deliver 100 trillion watts (100 terawatts) of power and 1 to 2 million joules (megajoules) of energy — the energy of a stick of dynamite — onto a central target in ion-beam fusion experiments beginning in 1987. These are levels considered necessary to ignite — for the first time — a fusion fuel pellet. Ignition is a long-sought goal on the path toward developing fusion — the reaction that powers the sun — as a possible energy source in the next century.

Tom estimates that with this certification of the Marx generators in PBFA II, roughly half the components, in terms of, complexity of the final machine have now been installed and satisfactorily tested. "So a major portion of the entire accelerator has been checked out."

The 36 individual Marx generators operating in parallel form the world's largest Marx generator. Each one of the individual units can accumulate and then release 390,000 joules of energy. (This is about three times the energy of the Marx generators in PBFA II's predecessor, PBFA I, in operation since 1980.) So the 36-unit Marx system yields a maximum of 14 megajoules of energy (much of which is dissipated on its way to the target in the center of the ring).

Each individual Marx generator is 14 feet high and 7 feet on a side. In addition to its 60 capacitors, it has, among other things, 30 spark gaps. Each of this total of 2160 capacitors and 1080 spark gaps in PBFA II has to work perfectly during a shot sequence.

"It's a very large system with many parts," says Tom. "Lots of things can go wrong. Capacitors can short out, resistors can open, and gas gaps in switches can break down prematurely." All these problems manifest themselves as a prefiring — a generator activates before it is supposed to — which is a highly undesirable result.

Reliability is essential. Each spark gap

Capacitors: The Heart of Marx Generators

Power Trickles In, Zaps Out

PBFA II's energy-generation process begins with the Marx generators (named for their inventor, German scientist Erwin Marx). Each Marx generator is basically a bank of 60 large capacitors. Since there are 36 Marx generators in PBFA II, the entire accelerator has a total of 2160 capacitors.

A capacitor is a device for storing electrical charge. Because work has to be done to charge a capacitor, a capacitor can be thought of as storing energy as well as charge.

In Sandia's Marxes, energy is put in slowly and discharged suddenly. Drawing initial power from the local power grid, the Marx generators build up electrical energy over about a two-minute period by charging the 2160 large capacitors in parallel at low voltage and low current, then suddenly discharging the capacitors in each individual Marx in

series at high voltage and high current.

The process of charging in parallel (like filling buckets one after another) and discharging in series (like jerking all the bottoms off the buckets simultaneously while they're stacked on top of each other) creates extremely high voltages and extremely fast discharge times. All the accumulated energy is released in about one millionth of a second, increasing the power enormously.

In the finished machine, transmission lines, switches, and other capacitors will further compress the pulses by about a factor of 20 or so and channel them toward the center of the accelerator. In the Marx tests just completed, the energy was discharged into several dummy loads — water resistors — because the interior portions of the accelerator are not yet finished.

in a Marx has to operate with a 0.999991 probability of firing correctly. To ensure reliability, the Marx generators have been put through a rigorous testing process.

"We have a long history that we apply to determining the Marxes' reliability and performance," notes Tom. Sandia's long experience with Marx generators in Hydra, Proto II, and PBFA I was used to design PBFA II's Marxes, the fourth generation of this Marx generator. Then one Marx generator was assembled as a demonstration module (DEMON) and, over several years, test fired more than 2000 times. Then components for 36 identical units were procured and assembled by Sandia engineers and technicians into individual Marx units.

Before the 36 units were installed in the outer ring of PBFA II, each was fired individually 30 times. Only then was the entire interconnected system installed and test fired. Five or six such system tests were conducted in early August, with good results.

"It's not a simple design," says Tom, "so with the success of the tests, we breathed a big sigh of relief."

Jitter — the unpredictable difference in time of firing for a single Marx unit — was appropriately quite small, on the order of 3 to 5 nanoseconds (billionths of a second), or the time in which light travels 3 to 5 feet. This low individual jitter resulted in a 36-Marx timing spread — the first to last firing difference — of 35 nanoseconds. The spread of the entire 36-module PBFA II will be reduced further by laser-triggered gas switches between the generators and the target. The pulses must be precisely timed to arrive at the center of the machine at virtually the same instant to ensure that the extraordinary quantities of energy and power are delivered efficiently and symmetrically onto the target.

The Marx generator system tests were conducted while the "downstream," or interior, portion of PBFA II is still under construction. The test shots were conducted after the construction workday to avoid interfering with the construction schedule.

During the tests, the Marx generators were immersed in insulating transformer oil — 500,000 gallons of it — as they will be during full accelerator operation.

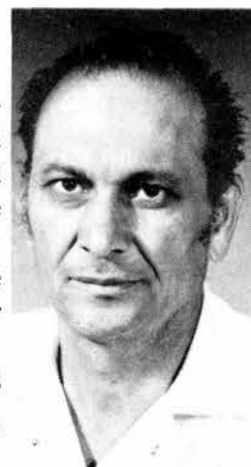
Tom estimates that 40 to 50 Sandians have worked on some stage of the the design, assembly, test, and operation of the PBFA II Marx generators. "A particularly wide range of people from a number of Sandia organizations contributed," he says. Especially instrumental, he says, have been Larry Schneider, Tom Woolston, Mike Wilson, and their colleagues in Pulsed Power Engineering Division 1251 (Ed Burgess, supervisor); Mike Wilson, Bob Johnston, Gerold Ziska, (KTech) and Dan Jobe (KTech) of Pulsed Power Operations Division 1254 (Steve Goldstein, supervisor); and members of the Pulsed Energy Projects Division 1201 (Gerry Barr, former supervisor, now 7860).

Death

Fidel Salazar of Pattern, Foundry, and Heat Treat Section 7473-5 died suddenly Sept. 17. He was 50.

He had worked at the Labs since September 1969.

Survivors include his wife, two daughters, and two sons.



Sympathy

To Luberto Ortiz (7818) on the death of his mother in Albuquerque, Sept. 5.

To Peggy Burrell (3543) on the death of her mother-in-law in Albuquerque, Sept. 9.

To Mike Gray (2812) on the death of his father-in-law in Tulsa, Sept. 18.

To Ben Montoya (7818) on the death of his son-in-law in Albuquerque, Sept. 11.

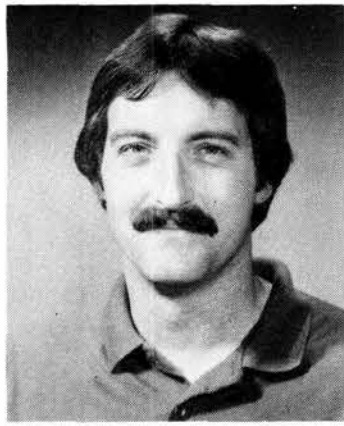
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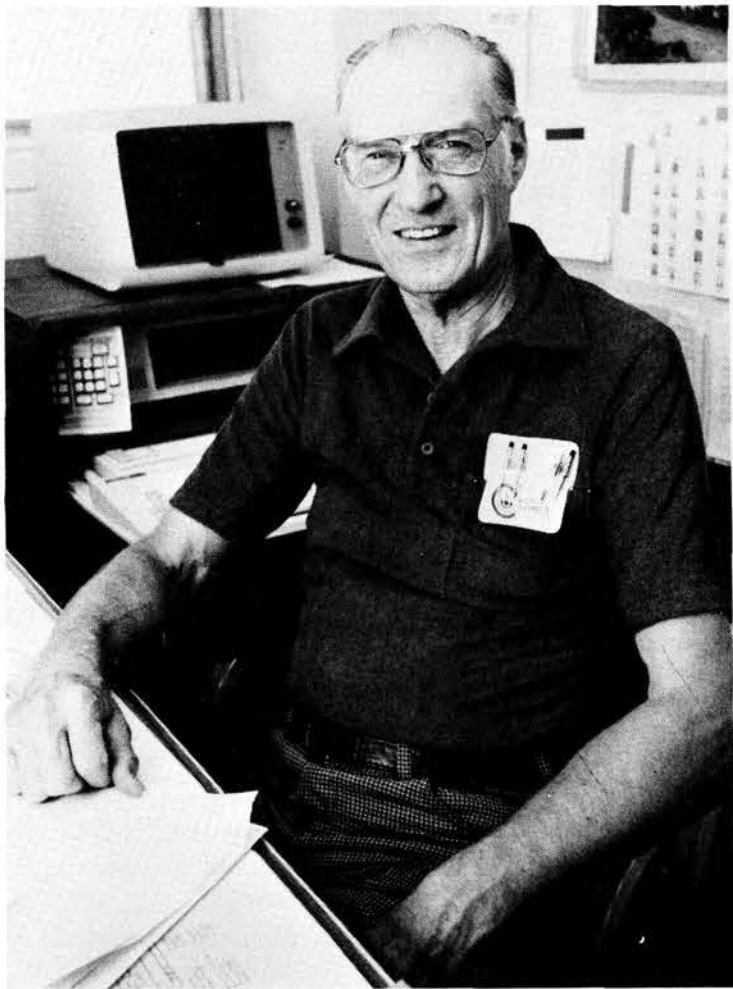
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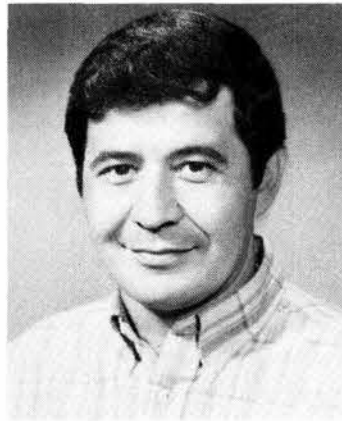
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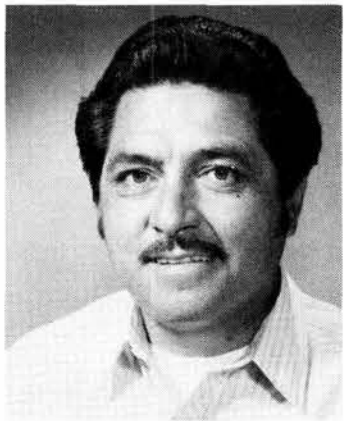
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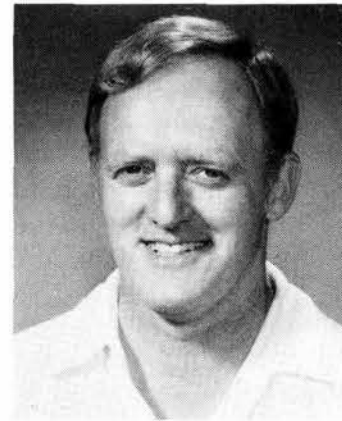
Myron Barnes (151) 35



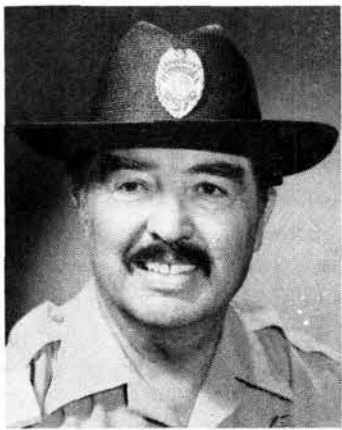
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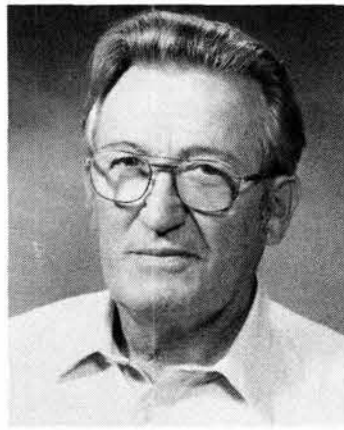
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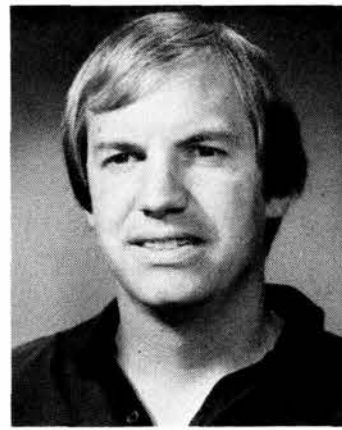
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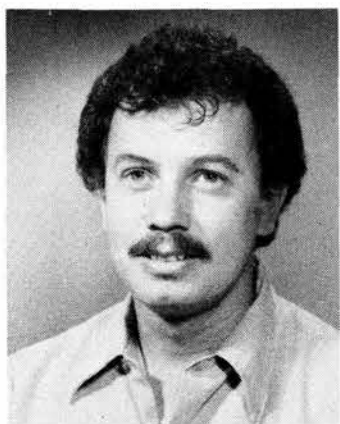
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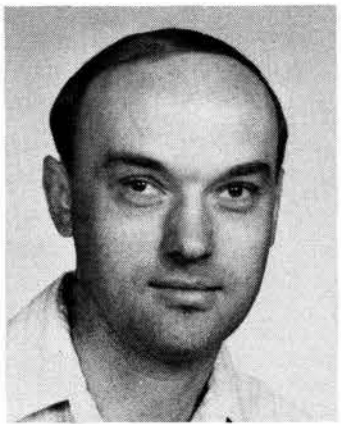
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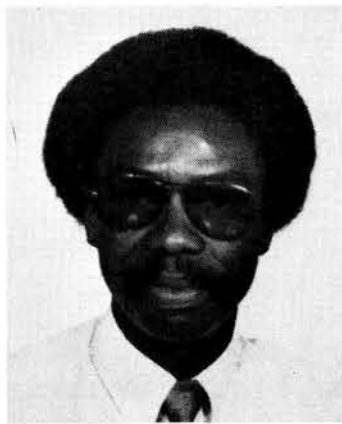
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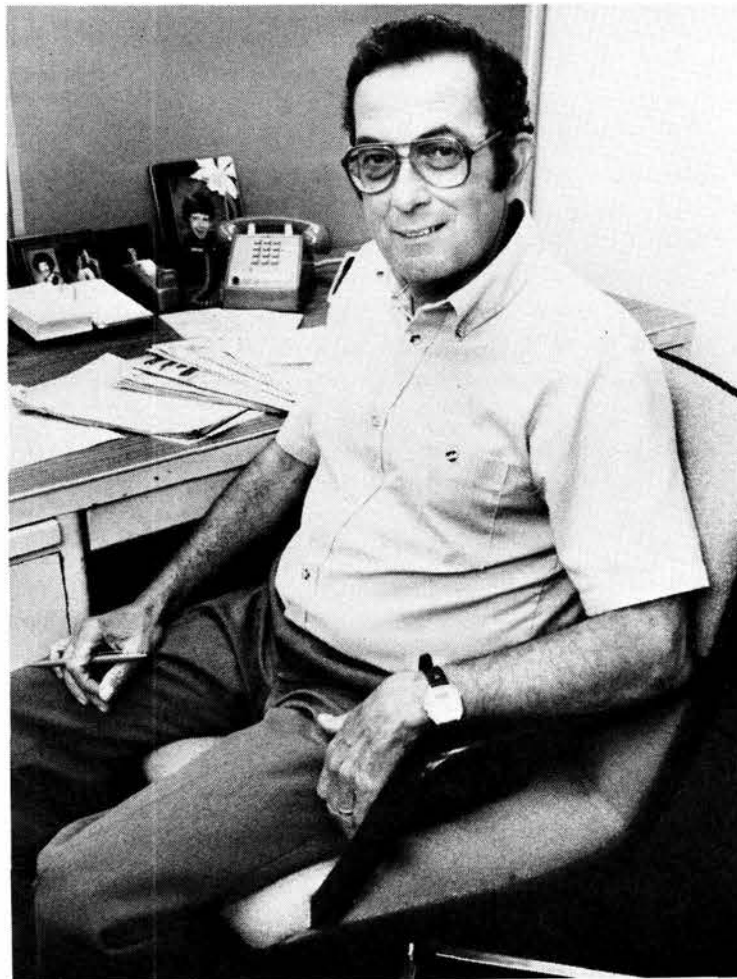
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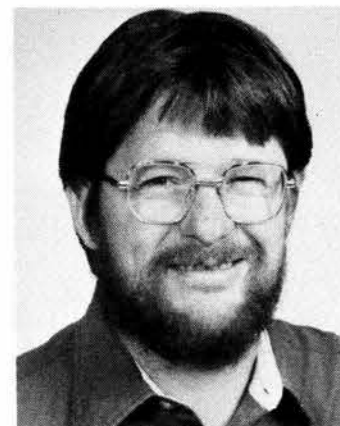
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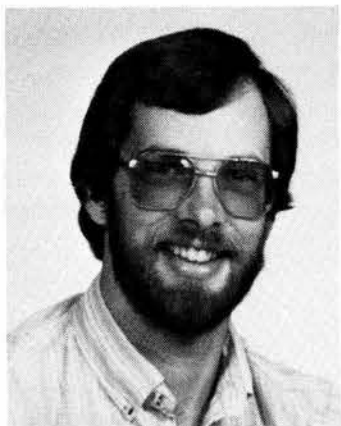
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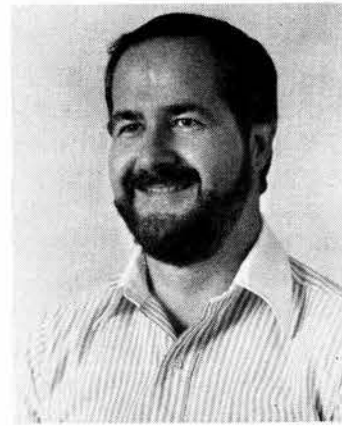
Larry Verzi (3741) 30



Gary Simpson (8176) 10



Jim Van De Vreugde (8354) 10



Dick Casey (7170) 10

Congratulations

John Woodworth (1821) and Nancy Ball married in Albuquerque, July 26.

Evelyn Pafford (2624) and Warren Miller (6331) married in Albuquerque, Sept. 20.

Mike (5347) and Jeannie Johnson, a daughter, Dayna Jeanelle, Sept. 11.

Renee (1831) and Ron Coonen (3434), a daughter, Wendy Renee, Aug. 19.

Estate Planning Seminar Oct. 3

A free seminar for all Sandia employees, retirees, and spouses interested in estate planning, especially for retirement, is set for Oct. 3.

Unlike similar presentations by commercial firms, the seminar will be objective and non-biased — no sales pitches for any specific investment plan. Leading the seminar will be a lawyer, an accountant, a finan-

cial planner, and a recent retiree familiar with Sandia's benefit plans.

If you'd like some help in getting through the money morass, come to the Coronado Club dining room on Oct. 3 at 5 p.m. Reservations aren't mandatory but helpful in planning; call Anita in the Credit Union on 4-4555.

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2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8 1/2 by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per issue per category.
8. No more than two insertions of same ad.
9. No "For Rent" ads except for employees on temporary assignments.
10. No commercial ads.
11. For active and retired Sandians and DOE employees only.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

DOUBLE bed w/box springs & mattress, \$100. Leatherman, 268-3754, 242-6789.

WASHER/DRYER, Kenmore, used 2 yrs.; wood spool table; glass-topped end & coffee tables; med. dog house; overstuffed rocker. Maish, 898-8027.

COUCH, sleeper, \$40; 3-dwr. dresser w/ig. mirror, \$40; coffee table w/mosaic insets, \$20. Neal, 292-8675.

FORD pickup 5-hole rims w/useable tires, \$45/four; '73 Ford Explorer hubcaps, \$25/four. Roberts, 881-2815.

COUCH, blue/green/gold, \$100; recliner chair, gold, \$75; Gympac 1000 exerciser, \$200 OBO. Purcell, 296-4986.

IDLETIME slide-in camper w/boat rack, \$350. Gleason, 836-5612.

POPLAR trees for cutting down; B&W 5" port. 82-channel TV, \$50; B&W 12" Magnavox TV, \$50; easels, \$3 ea. Smith, 299-7151.

CALCULATOR, TI Business Analyst model, port. w/AC adaptor, case & owner's manual, \$15. Barr, 821-5870.

DINING table, 31"x51", smoked glass top, chrome legs, \$75. Lehrer, 831-4360.

INSULATION kit, water heater, round, gas or elec., up to 80 gals., never unpacked, new \$25, sell \$20. Schkade, 292-5126.

ANTIQUE dining room buffet, solid oak, \$400; other antique items. Gregory, 293-2080.

BED, Calif. king size, some sheets included, \$145; cemetery lots (4) Sandia Memory Gardens, current cost \$425 each; make offer. Vandt, 255-0685.

CANON AE1 w/35-70 zoom, flash, & bag, \$200. Anderson, 836-5483.

WOOD door w/glass panels, 36" wide, w/miniblinds, shears & glass storm door, \$80. Mueller, 821-5267.

'85 CAMPER, pop-up, cabover, fits small truck, sleeps 4, gas stove & refrig., power converter, no down, finance balance. Orth, 292-6174 after 5.

DRUMS, snare w/stand, Zildjian cymbals, one 18" w/stand, two 15"

w/sock stand, \$250. Miller, 268-5992.

ANTIQUE secretary; pecanwood Baldwin Hamilton, full size piano; Admiral 3-dr. refrig. Miles, 1-832-6808.

CARPETING, red tone swirl pattern, 11'x12', \$60 OBO; tire chains, A7813, \$15. Pisarra, 888-9464.

CHAIN link fence, approx. 67', 4' tall, w/gate, posts, & all hardware, \$100. Breden, 292-0775.

HOTPOINT, built-in dishwasher, \$50; 8 Lennox china cups & saucers, cream/gold band, \$20. Brodie, 292-2810.

ROWING machine, 5-position DP 300, 1 yr. old, new \$129, sell \$70. Lauffer, 298-9245.

SOFA (90") & chair, matching end tables & coffee table; table lamps; approx. 30 yds. used wool carpet. Mitchell, 884-4219.

BRUNSWICK billiard table, 8' model, 3/4" slate, new \$895, sell \$550; Sears 6' pool table, \$45. Hoke, 298-6619.

ROTTWEILER puppies, born Aug. 28, 4 male, 4 female, AKC reg., championship lines. Newman, 881-3816.

COMPUTER system: C64, 1541 disk drive, TV/monitor, color printer, musical keyboard, mupet learning keys, recorder, stand, light pen, lots of software & more, \$850 OBO. Perea, 873-2515.

BOYS' 20" bike, \$35; small gas wall heater, \$25; several glass panes. Phipps, 299-3151.

'61 RED DALE travel trailer, stove, icebox, heater, \$2K OBO. Lowe, 299-7725.

ELEC. wall furnace, 220V, reverse flow, fan forced, w/wall thermostat, will deliver, \$100. Crabb, 344-5415.

OLD upright piano, Story & Clark, tuned & delivered, \$800. Hulme, 299-7715.

COMPLETE gasket set (except head gasket) for 20 RC Toyota engine, \$8; 6-hole 16" Chevy wheel, \$5; wheel for '78 Datsun B210, \$5. Hall, 298-8617.

CAR bike carrier; car top luggage rack; 8-track cases; Admiral 14" TV; box fan. Webb, 294-8341.

APPLES, red & gold Delicious, Rome, McIntosh; picked weekly by youth for school project, \$4/bushel. Bruneske, 898-0717, 836-0459.

CHANDELIER, cut glass & brass, moderately ornate w/flame-shaped lightbulbs, \$120. Nordeen, 296-7898.

ARABIAN FILLY, Reg., 1 1/2 yrs., descendant of Hindi Imports. Hindi, 299-8996.

POOL table, 8', 3/4" slate, all accessories included, \$350; Dynamo Foosball table, \$225. Heames, 884-7580.

METAL framing material, assorted sizes; hubcaps for Chrysler cars; cinderblocks; gas space heater. Mozley, 299-4204, 265-2625.

SEARS 10" table saw, \$275. Eisenberger, 877-7041.

RADAR detector for motorcycle, \$75. Stephenson, 299-3914.

REFRIGERATOR; day bed; TV; sewing machine; desk; glassware; lamps; blond twin bdr. set; end tables; glass top tables. Baars, 255-9051.

ELECTRIC wall heater, Sears best, 220 volts, 5000 watts, fan driven, adjustable, \$50 OBO. Kubiak, 265-6525.

SOFA, green velvet, \$250; love seat, Early American style, blue plush, \$125; braided rug, 9x12, \$50;

Lowery organ/bench, \$350; port. dishwasher, Sears Kenmore, butcher-block, \$150. Youngblood, 881-6013.

SEARS Coldspot w/icemaker, \$75; Simmons hide-a-bed, \$100; Panasonic & Realistic stereo systems, Fisher stereo console, Zenith TV, each under \$100. Davie, 821-7755.

MASSAGE health machine, Stouffer, complete w/bench & elec. rocker unit, \$50; exhaust fan, window unit, fwd. & reverse, 20", \$25. Jones, 881-8341.

'83 KOMFORT 40' travel trailer, tip-out, dual AC, W/D hook-up, storm windows, Levelor blinds, rollout awning. Daut, 255-2529.

VIOLA, Roth, full size (15"), w/case, \$250. Hadley, 821-7324.

LIMED oak double bed, matching dresser & mirror; National Geographic, Encyclopedia set 1940; cookbook set 1925; Sunbeam weed eater. Reich, 821-5528.

WATERBED, queen size, heater, mattress, liner, frame, heater warranted for 3 more years, \$175. Pierce, 299-2801.

DOUBLE bed boxsprings & mattress, \$75; 8' bookshelves, 3-tiered, solid wood, \$50. Wilkinson, 821-8306.

DECORATIVE U-shaped wrought iron, \$10 ea., 2 pieces (61w x 60h) for 36" w windows, 1 piece 85w x 48h for 60" w window. Newcom, 293-5180.

CHILD's umbrella stroller, \$5; table lamp, handpainted cookie jar shape (tan) laminated pleated fabric shade, 29" high. Burstein, 821-6688.

SCREEN door, 31 1/2"x80", \$5; storm door, 31 1/2"x80 1/2", \$10; apple corer, parer, peeler, \$15. Cash only. Hoff, 294-4835.

STORM doors, aluminum, sliding glass, Sears 2'6"x6'6", Wards 3'x6'6", \$20 each; 23" Heathkit color TV, \$50. Hopkins, 255-8902.

CRIB w/mattress, bumper pad, sheets, \$65; high chair, \$8; Gerry backpack, \$12; car booster seat, \$5; pressure gate, \$5. Roehrig, 281-2695.

COLT match target pistol, 22 cal. w/extra clip. Miles, 1-832-6808.

COLT CAR-15 carbine, 30 & 20 rd. magazines, \$435 OBO; free port. dishwasher, runs, but leaks. Healer, 298-6967.

KIMBALL Aquarius organ; 1 1/2 yrs. old, \$1400. Jellison, 296-9155.

GARAGE sale: cribs; strollers; car seats; children's clothes; household items, Sept. 27-28, 4104 Lara Dr. NE. Hartwig, 298-5048.

RUSSIAN-made 35mm camera, 58mm f2 lens, built-in light meter, w/leather case & instructions in English, \$125. Schubeck, 821-3133.

AKC Siberian Husky pup, \$200 OBO. Puccini, 255-0568.

TRANSPORTATION

HIS/HERS bicycles, matching Schwinn Suburban 5-spds., 27" wheels, available separately, \$50 each OBO. Kubiak, 265-6525.

'80 CHEV. Impala, 4-dr., 8-cyl., AC, radio, \$3400. Torres, 869-3159.

MEN'S 27" 10-sp. touring bike, \$40. Roberts, 881-2815.

'80 FORD Mustang, low miles, burgundy, 4-sp., AM/FM, \$2950. McInteer, 296-1656.

'75 FORD LTD Landau, 59K miles, PS, PB, PW, tilt, AM/FM, custom interior, burgundy, \$2200 OBO. Lenhart, 293-7223.

ODYSSEY moped, basket, low miles, no license required, \$150. Henning,

296-6337.

'79 MONZA Spyder, red, V8 sports pkg, low miles, \$3150; '83 Chevrolet Camaro, lt. blue, loaded; '77 Datsun 280Z. Brantley, 294-6875.

'64 JEEP 4x4, V6, Buick engine, approx. 4K miles on engine, HT, 13 mpg, \$2500; '84 Laser XE Turbo, loaded, new tires, new \$16,900, sell \$11,500. Gregory, 293-2080.

'78 OLDS Starfire SX, 78.5K miles, 6-cyl., AC, 4-sp., AM/FM, \$1750 OBO. Branstetter, 292-6369.

'77 BMW coupe, AC, 4-sp., Recaro seats, bra, car cover, rare BMW orange, 60 series tires, alarm, stereo, \$7600. Gonzales, 292-5570.

'79 HONDA Accord LX, new Michelin XZX radials, new brakes, new clutch, 48K miles, \$2950. Bland, 265-6286.

'80 CHEV. Monte Carlo, V6, AT, no air, new brakes, 46K miles, \$3400. Duvall, 881-4406.

'74 HONDA Trail 90, 3600 miles, bumper carriers, first \$400 takes it. Ford, 294-6133 after 5.

'82 YAMAHA 750 Virago, shaft drive, helmets, new tires, \$1600; will trade for car or truck. Bishop, 822-8295 after 6.

'75 KAWASAKI KZ200, 704 miles, \$700. Terri, 298-0341.

'64 CHRYSLER Imperial Le Baron, all options, daily use, \$2200. Barndvold, 296-4394.

'75 COLT stn. wgn., SB radials, \$950; '75 Honda 750 motorcycle, \$500; 27" Nishiki International bicycle, \$90. Riggan, 268-1961.

'84 CAMARO, V6, AT, AC, AM/FM cass., EPS, tilt wheel, white w/blue interior. Anderson, 298-0477.

'67 MUSTANG, 289 engine, runs, needs body work on front end, \$950. Sellers, 344-5583.

'62 HONDA SS trail bike w/bumper carrier, tools, instruction manual, \$150. Hall, 256-3665.

'80 CHEV. C20, Silverado, camper special, loaded, AC, AT, PS, PB, cruise, HD system, less than 29K miles, \$6300. Perea, 873-2515.

'83 MAZDA B2000 pickup, AM/FM stereo, cassette, topper, seats & belts in back, bed liners, trailer hook up, \$3900. Knapp, 294-6359.

'81 KAWASAKI KDX 250, needs trans. work, \$250; Roger DeCoster dirt bike, extras, \$75; Sims skateboard, \$50; hydroslide, \$45. Feltz, 293-8732 after 5.

BICYCLES, men's 26", 10-sp., 21" frame, Montgomery Ward, \$45; boy's 24", 10-sp. Miyata, red, \$45. Beard, 821-0309.

'82 S-10 Chevy pickup, 4-cyl., 4-sp., AC, shell, book is about \$5K, sell \$4K. Laird, 292-4215.

'83 CHRYSLER 5th Ave., fully loaded, sun roof, at loan value. Carli, 298-9271.

'76 PONTIAC Grand LeMans Safari wgn., PS, PB, AT, AC, AM-FM stereo, \$1200. Wilhelmi, 255-4932 after 5.

302, V8, engine & auto. trans., off '69 Mustang, runs, uses 1 qt. oil every 600 miles, \$350. Vigil, 296-3590.

'67 FIREBIRD, \$2500 OBO. Gomez, 865-0726.

'81 CHEVETTE, AC, 4-dr., AM/FM cassette, 4-sp., Walker, 294-2293.

'73 FORD LTD, 2-dr., \$975. Morris, 299-6519.

'77 KAWASAKI KH400, \$325 OBO. Phillips, 268-7212.

'80 FLT Harley Davidson Tour Glide, low miles, some access. included,

\$4200 OBO. Serrano, 293-1066.

'77 TOYOTA Celica GT, 5-sp., CC, AC, AM/FM cassette stereo, \$2300. Gomez, 821-0685.

'67 PONTIAC LeMans, 326 V8, 2-dr., AT, \$600 OBO. Balk, 281-9083.

'67 BUICK LeSabre 4-dr., 2 new tires, new: fuel pump, carb. OH, shocks, muffler, \$750. Lang, 884-5288.

'83 BLAZER, 6.2L diesel, many extras, \$11,900. Dupree, 294-1835.

REAL ESTATE

3-BDR., 2 bath, in SW, den w/fp, lg. greenhouse, storage, alley access, many recent improvements, near elem. school, \$55K. Anderson, 836-5483.

14'x70' MH, 3-bdr., 2 bath, free-standing wood stove, refrigerator & swamp cooler, \$11,500. Vigil, 869-6870.

NE heights, 3-bdr., assume FHA loan at 11.5%, no closing costs, \$7K down. Johnson, 881-3498.

3-BDR., near southeast, 2 baths, dbl. garage, carpet & hardwood, southwest landscape, updated throughout, \$92K. Mauldin, 265-5650.

1 ACRE Crested Butte, Colo., near Ski Area, Slate River front, golf course nearby. Carli, 298-9271.

3-BDR., 2 bath, DR, 1 fenced acre, Los Lunas, 2 wells, 2 storage bldgs., many trees. Robinson, 865-7476.

35' DIAM. geodesic dome kit, 2000+ sq. ft. possible, many extras, REC possible. Phillips, 268-7212.

4-BDR house, 2000 sq. ft., 1 1/2 bath, LR/DR, lg. kitchen, landscaped w/auto. sprinklers, gazebo w/spa, Eldorado School, avail. April '86. Ratzel, 821-6368.

ASSUMABLE 7 1/2%, Candlelight 2-bdr., 1 bath, single garage, woodburning stove, lg. landscaped lot, Ladera area. Dalby, 831-9326.

2000 SQ. FT., 4-bdr. on .3 acre cul-de-sac, 12 varieties of fruit trees & vines, easy access to base, \$115K. Neyer, 299-2112.

WANTED

GOOD, reasonably priced boy's ski equipment — skis (140 to 150cm) w/bindings & brakes, boots (size 7 1/2 to 8), & poles. Perrine, 293-1429.

LEFT HANDED golf clubs. Prairie, 821-4556.

SOMEONE to clean small house 2 or 3 times a month, no heavy work involved. Tomek-Martinez, 292-3041 after 5:30.

NORDIC track exercise machine; rent car-tow trailer for one week about Nov. 1. Brooks, 299-1884.

LARGE 28' or 32' extension and 16' or 18' step ladders: let me know what you have. Braasch, 268-8416.

TIRE chains for light truck, tire size 31x10.50 R 15 LT. Hitchcock, 821-8149.

HOUSEMATE, female, share 3-bdr., 2 bath, garage, yard, den w/fp, Juan Tabo/Central, smoking, most pets allowed, free utilities. Nordeen, 296-7898.

TO BUY house or townhouse for \$50K or less, assume loan and carry REC. Martinez, 292-3041.

TWO size 165SR13 radial snow tires. Underhill, 294-5774.

SHARE-A-RIDE

WANT to join car pool, pay to ride, no driving, vicinity of 4th & Osuna NW. Finger, 345-6865.



RETIRING NEXT WEEK are (front row, from left) Ed Stang (5232), Bill Brooks (1221), Jim Hillman (7253), Charles Grassham (7544), Tom Pace (7120), and Roy Lambert (7231). In the second row are Lloyd Barnes (5122), Joe Connell (7261), Murray Silverman (5252), Jack Teta (7251), Don Gunderson (5112),

Bob Luikens (5126), Bill Austin (3741), and Benny Garcia (3432). In the top row are John Armijo (7474), Wynne Grace (5249), Gerry Cobb (5249), Dave Lindsay (3424), Betty Sherred (155), LaRue Wildgoose (7864), Vi Salas (152), Marilee Letourneau (155), and Ray Letourneau (5171).

Coronado Club Activities

Mehlhorn New Club President; Bon Voyage Sunday

Tom Mehlhorn (1265) was named president of the Club's board of directors last week. Vice-president is Leo Klammer (2567). Phyllis Padilla (3521) is secretary and Chuck Duus (132) is treasurer. The Club membership elected new board members at the annual meeting earlier this month. The board selects its own officers.

TONIGHT, in the dining room, a two-for-one special is offered — either prime rib or scallops for \$12.95. On the bandstand, the popular Isleta Poor Boys play country and western music for dancing. Call 265-6791 right now to find out about reservations.

NEXT SUNDAY, Sept. 29, is the great "Bon Voyage" party for retirees leaving Sandia on the 30th. Don Lesmen's big band will be on the bandstand, a terrific buffet is planned by the Club's chef, and special prices will be in effect all evening. Festivities get under way around 5 p.m., the buffet is spread at 6, and the band starts playing at 7. There are a few tables left. If you want to join the party and wish the retirees good luck, call 265-6791.

NEXT FRIDAY, Oct. 4, Jeanne Rich and Friends will be on the bandstand playing a variety of musical styles for dancing. The dining room offers two-for-one filet mignon or fried shrimp for \$12.95.

VARIETY NIGHT is set for Saturday, Oct. 5, and features Walt Disney's classic animated version of *Alice in Wonderland*. A family-oriented buffet will be spread at 5; the movie starts at 6. Admission is free to members and families.

SEVERAL ITEMS should be marked on your calendar now so your plans can be made early. The Ski Club starts the new season with a meeting on Thursday, Oct. 15, at 6:30 p.m.; the Coronado Club Single Mingle happens Thursday, Oct. 24 at 5 p.m.; the Thunderbirds retiree group holds a dinner dance on Saturday, Oct. 26; and the Club's annual Kids Halloween Party featuring the infamous "House of Horrors" is set for Sunday, Oct. 27, at 6 p.m.

THE THUNDERBIRDS card playing group's fall schedule calls for sessions on Sept. 30, Oct. 7, Oct. 21, and Nov. 4. Starting time is 10:30 a.m.

TRAVEL — Deadline for signing up for the Mazatlan trip is next Tuesday, Oct. 1. The trip is scheduled Nov. 12-19 and includes airfare, transfers, seven nights at the luxurious Playa Mazatlan, a cocktail party, and a Fiesta Night. Price is \$439. Tour guides are Chet Fornero (ret.) and Fred Sanchez of TransGlobe Travel.

The Club announces a new trip for windsurfing in San Diego on Nov. 15-17. The package includes airfare, two nights at Dana Inn and Marina, transfers, and two days windsurfing gear rental with one hour of instruction. Cost is \$249. Sign up with Stan Ford, recreation manager, at the Club or call 4-8486.

Upcoming trips include a charter bus excursion to Havasu City/Laughlin, Nev., Oct. 12-15 with lodging at Sam's Town Casino (\$160) and a Dallas Adventure tour to take in the Cowboy-Cardinal game on Nov. 27-Dec. 1 (\$248).

Home, Family and Purdue



"In countries where the curriculum requires students to make a choice between subjects, allowing young women to opt out of science, the emphasis is on counseling, presenting careers in science and technology as interesting, challenging and providing opportunities to serve the community. In the U.S., where it is possible to start physics and engineering studies at college from scratch, providing one has the necessary background in mathematics, there are moves to attract female undergraduates to these courses and retain them by setting up support networks and inviting practising women engineers to talk not only about their work, but also about how they organize their personal lives with home and family responsibilities. Using such techniques over a 10-year period Purdue U. can now claim that women form one-third of its undergraduate engineering students (compared with an average of about one-20th in the UK)."

Jan Harding in *New Scientist*